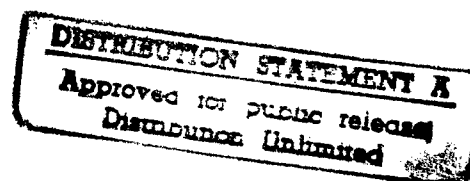


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Soviet Union

USA: ECONOMICS, POLITICS, IDEOLOGY

No 11, November 1989

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Strengthening Security of World Ocean

904K0004A Moscow SSHA: EKONOMIKA, POLITIKA, IDEOLOGIYA in Russian No 11, Nov 89 (signed to press 20 Oct 89) pp 3-12

[Article by Grigoriy Melorovich Sturua, candidate of historical sciences and sector head at Institute of World Economics and International Relations]

[Text] It is probable that the views of Warsaw Pact and NATO countries diverge more on ways of improving the situation in the world ocean than on any other matter connected with the consolidation of security. The United States and its North Atlantic bloc partners usually try to affirm the view of naval arms—strategic and conventional—as means of strengthening stability. In the opinion of the U.S. and NATO politico-military leadership, naval forces and operations should be left out of agreements during the initial stage of the lowering of the level of military rivalry between the two alliances (it is quite indicative that people in the U.S. military establishment are even trying to conceal the fact that “naval arms control” prospects recently began to be investigated). It does not take a great expert to see that the West’s approach to disarmament is skewed when one of the components of the balance of military power is artificially removed from the overall balance and when an almost open-ended taboo is imposed on its limitation.

This situation naturally arouses concern because there is no question that the search for ways of reaching agreements on the naval aspects of the arms race must be intensified. The significance of efforts in this area has increased as a result of the following alarming tendencies:

A new U.S. strategy puts the emphasis on a first, preemptive strike against enemy naval forces, military bases, and strategic submarines. In line with this strategy, successful joint actions by the naval forces of NATO countries might be the main factor in securing the favorable outcome of a military conflict;

Since 1983 naval forces have been armed with Tomahawk cruise missiles, a new type of strategic weapon. The main characteristics of these missiles suggest that they are capable of undermining the stability of the strategic situation (the targeting accuracy of the sea-launched cruise missiles is measured in tens of meters, they are extremely difficult to pinpoint with existing technical systems, and their flight time to strategic targets might

not exceed a few minutes). The absence of external marks distinguishing the nuclear Tomahawks from the missiles with a conventional warhead seriously complicates their inclusion in the disarmament process;

Nuclear weapons on the ships of the U.S. Navy have no special devices to prevent their launching without authorization from shore commanders, and this, in the opinion of experts, increases the danger of their unauthorized use, especially at times of crisis;

The United States and its European and Pacific allies have intensified the preparations for “strategic submarine warfare,” intended to nullify the invulnerability of the naval element of Soviet strategic forces. The United States is still spending more money on these preparations than on the “Star Wars” program;

The Navy is the branch of the armed forces that has been used most frequently in various international crises. The ease with which Washington and its allies resort to naval instruments of forcible pressure in regional conflicts creates the real danger of their escalation.

There are several difficulties impeding the limitation of naval operations and naval arms. The issue of security in the world ocean probably represents the “toughest nut to crack” in the current East-West dialogue in the sphere of disarmament.

The cardinal differences in the geographic-military conditions of the USSR and the United States and of the Warsaw Pact and NATO constitute the objective basis of the disputes and disagreements over all measures to curb the naval arms race. The United States and its allies have important geostrategic advantages from the standpoint of the use of the world ocean for military purposes. The U.S. Navy has open access to the Atlantic and Pacific oceans at any time of the year and can rely on the diversified infrastructure of bases and shore installations, some of which are located near the Soviet Union and the countries of the socialist community and which secure a high level of combat readiness.

The distinctive features of the USSR’s geostrategic position, however, are such that its naval ships cannot gain access to the ocean until they have crossed narrows and straits bordering on the territory of the United States’ politico-military allies. In the event of a conflict, the NATO command could block them and thereby stop the strategic deployment of the Soviet Navy. The four Soviet fleets—Northern, Baltic, Black Sea, and Pacific—operate at great distances from one another. The bleak climate and the ice in some regions create serious problems for the Soviet Union’s naval ships.

When imbalances of a geographic nature have been discussed at the Vienna talks or at the conference on confidence-building measures and on security and cooperation in Europe, Washington has objected to agreements that might minimize U.S. geostrategic advantages. Certain segments of the American ruling elite simply cannot accept the possibility of the neutralization of

these odds, which some people see as proof of the exceptional nature of the United States. This aspect of the approach to measures for a lower level of military confrontation in the world ocean cannot be ignored. Even today, now that America's welfare clearly does not depend only on its naval strength, the reaction to potential changes in the situation in the world ocean that might upset the status quo, to which the United States grew accustomed so long ago, has been extremely temperamental.

The navy is a more flexible instrument of foreign policy than other components of the military strength of states. The standards for the development and use of the U.S. Navy in peacetime are a reflection, to some extent, of the country's general foreign policy line and of the changes made in this policy by Washington administrations. Obviously, the consent to the substantial reduction of naval activity in a particular region must be preceded by considerable changes in policy toward the region (these changes do not always serve to strengthen peace and security, and this will be discussed below).

Plans for the use of the U.S. Navy took the distinctive advantages of this branch of the armed forces into account in the "Post-Vietnam era." After the failure of the Indochina venture, the Americans had extremely negative reactions to attempts to deploy U.S. ground troops abroad. The concentration of American naval ships in any part of the world, however, provided Washington with an effective instrument of armed intervention and generally encountered less resistance from Congress and from broad segments of the American public.

The U.S. stand on the reduction of naval activity is also influenced by the American public's invariable tendency to view the Navy as the "first line of defense." It would seem that the nuclear age, with its weapons with trans-continental capabilities, should have completely buried the illusions about the oceans as impregnable fortress walls. The advantages and drawbacks of the "maritime strategy," based on "American withdrawal" from Eurasia to the seas and oceans, are debated with enviable regularity, however, in the United States (these discussions were conducted in the early 1970's, and they were particularly intense during the first years of the Reagan administration).¹

Of course, this is not just a matter of the latent isolationism characteristic of American foreign policy thinking. In all probability, the U.S. politico-military leadership feels a need to consider every possible American response to changes in the international situation that might necessitate the elimination of the U.S. military presence abroad. It is not so difficult to imagine that the "survival instinct" might bring up the idea of transferring U.S. military strength from the land to the sea just as the first stones are being laid in the foundation of the nuclear-free world. The initial reaction of U.S. and NATO politico-military groups to the prospect of the INF Treaty was quite indicative in this respect: They

wanted to build up the striking force of the American Navy in European waters to compensate for the reductions.²

The messianic view of the Navy's role in establishing and maintaining the might of the United States as an "insular power" and the long-cherished dream of taking advantage of the vulnerability of an adversary in Europe or the Third World from the sea were the reason for the formulation of something that could not be described simply as doctrinal demands for naval supremacy. This was more of a philosophy, an ideology of American maritime supremacy. It would be wrong to associate the promotion of this idea only with the Reagan administration. Even in the 1970's, when the concept of nuclear parity began its labored search for acceptance in the United States, the U.S. politico-military leadership never renounced the goal of naval supremacy. The Reagan administration can be "credited" with breathing new life into the philosophy of the followers of American Admiral A. Mahan, the father of the theory of "sea power," who outlined the new parameters of U.S. naval strategy for many years into the future.

The situation in which Washington has more or less reconciled itself to the existence of a balance on the strategic level, and is consenting to negotiations as a result of this, has no analog in the naval sphere. Can we expect a state which claims special status as a "sea power," and which declares that its interests in the world ocean are unique, to readily begin negotiating the limitation of naval activity with an adversary it regards as a landlubber? Publications by American analysts suggest that agreement on naval problems would only benefit the "land power": Without diverting its funds to "unpromising" naval organizational development, it could concentrate on more advantageous areas of military development. It is indicative that people in the United States interpret the comprehensive proposals on security measures and arms limitation which also mention naval forces as a lack of serious intentions to reach an agreement and describe these proposals as propaganda ruses.

In the second half of the 1970's, however, the United States seemed to be close to reaching an agreement with the Soviet Union on the Indian Ocean. Some aspects of the deterrence of military rivalry in the world ocean have been discussed at various international forums in the 1980's.

As far as the dialogue on the Indian Ocean is concerned, this is more likely to be an exception to the rule. Washington sat down at the negotiating table as a result of temporary circumstances which will probably never occur again. Besides this, they did not have that much impact on the Carter administration. The very first crisis in the Indian Ocean—near the Horn of Africa—blocked the talks, and then the events in Iran completed this process by guaranteeing the futility of all efforts to limit military activity in the Indian Ocean. It is significant

that U.S. ruling circles saw this agreement as a "risk factor": It would set a precedent for involvement in talks on naval issues.

Without going into the details of the Carter administration's approach to consultations with the USSR on the Indian Ocean, we should take note of one, seemingly paradoxical consideration. The talks owed their commencement partly to the administration's hope of keeping its naval superiority, but in more economical ways. The fragile balance of opinion in favor of the talks was a result of the understanding that the United States should not go beyond a mutual freeze on existing scales of military operations. The expectation was that the United States would retain what the administration thought of as its military advantages in the Indian Ocean and simultaneously use the newly available naval resources to strengthen its position near the Soviet maritime borders.

The high mobility of naval forces, which was certainly taken into account by the Democratic administration in its analysis of the pros and cons of an agreement on the Indian Ocean, presents a dilemma for the international community: How can the consolidation of regional security following the conclusion of agreements on the limitation of naval activity in a specific part of the world ocean be combined with the stabilization of the situation in other regions and the world situation as a whole? It is obvious that naval ships which are not used in one place can easily be moved to another and thereby heighten tension in a region that might be more important from the standpoint of the consolidation of peace. It is precisely this pattern of reduction that American experts are considering, although without any luck, in the Mediterranean Sea. They want to transfer at least part of the 6th Fleet to the North Atlantic, which is of much higher priority than the Mediterranean in the strategic sense.³

The United States is stubbornly avoiding any dialogue dealing specifically with naval issues, but it is discussing them within the framework of broader talks, and this is obviously contrary to Washington's wishes. Its spokesmen must be given credit for their ability to lead negotiating partners into military-technical mazes. These discussions focus on the setting of limits on long-range sea-launched cruise missiles and the extension of confidence-building measures to the seas and oceans. Some salient aspects of the clashes over these issues warrant more detailed examination because real efforts are being made to resolve them, and this cannot be said of many other proposed ways of strengthening security in the world ocean.

Verification of Agreed Limitations

With a view to the destabilizing parameters of long-range sea-launched cruise missiles (SLCM's), the Soviet Union insisted on a ban on the deployment of SLCM's with a range of over 600 kilometers at the strategic arms limitation talks in the 1970's and 1980's. The absence of a sincere desire on the part of extremely influential forces

in the United States to find a solution to this indisputably complex problem has made the search for a mutually acceptable compromise difficult.

The root of the whole problem with the SLCM's is the choice of the optimal method of verifying negotiated limits. The Soviet Union proposed a combination of verification procedures, including the remote monitoring of nuclear missiles on ships, verification of the installation of nuclear warheads on missiles, and inspections of submarines and surface ships.⁴

The American side has heard our arguments and comments, but it has not changed its skeptical view of the possibility of verifying the limitation of these weapons. In 1986 the head of the Arms Control and Disarmament Agency, K. Adelman, said: "We have been studying the problem for 5 years and have not found a verification method."⁵ Seeing no other way out of the impasse created by this problem, P. Nitze, who was then the special adviser to the President and secretary of state of the United States on arms control, proposed a bilateral ban on the deployment of any nuclear weapons (with the exception of submarine ballistic missiles) on Soviet and American ships in 1988. This radical approach, which would have simplified verification considerably, never did become part of the official U.S. position at the talks, however. When this plan of action was discussed in the administration, it was categorically opposed by Secretary of Defense F. Carlucci and the Joint Chiefs of Staff.⁶ Because of this, the issue of SLCM limitation was never addressed by the previous White House leadership, and today it is impeding the conclusion of the agreement on strategic offensive arms because the USSR and the United States agreed to settle this matter within this framework.

An agreement on SLCM's would probably necessitate the achievement of previously unimaginable technical-organizational heights in verification procedures. The completely real difficulties involved in creating a suitable mechanism for the verification of this agreement are nevertheless only an extremely convenient excuse for Washington not to include this category of weapons in projected agreements with Moscow, because the Americans believe that it will give them substantial unilateral advantages.

Because of the destabilizing effect the SLCM's will have on global military competition, they are frequently compared to MIRV'ed ballistic missiles. Parallels are also drawn between the United States' current position on cruise missiles and its SALT posture on MIRV'ed missiles in the late 1960's and early 1970's. The United States also had great hopes then for a qualitative breakthrough in the arms race and consequently had no interest in including MIRV'ed missiles in the SALT-I agreement. The success of our design bureaus quickly forced Washington to acknowledge the fundamental inaccuracy of these plans. Now MIRV'ed missiles are the component of strategic military strength the United States wants to limit first at the Geneva talks.

The author of this article has spoken with American experts who are deeply disturbed by Washington's near-sighted view of the SLCM's. Some of them were worried less about the future of the disarmament process than about the fact that the United States, with its long and easily accessible coastline, would be particularly vulnerable to cruise missiles launched from naval ships. In this respect, American researchers feel that the Soviet Union is in a preferable position because its main administrative and industrial centers are located far inland. According to some American calculations, 45 U.S. cities with a total population of 75 million are within 850 kilometers of the 200-meter isobath (a line, drawn on a map, connecting places at a depth of 200 meters), whereas the USSR has only 6 cities (with 2.2 million inhabitants) in this zone.⁷ Judging by the experience of the two sides with the MIRV'ed missiles, the appearance of Soviet naval ships armed with cruise missiles near U.S. maritime borders should give rise to an insurmountable American desire to reach an agreement on SLCM's as quickly as possible. It is reasonable to presume, however, that this way of solving the problem is not in the interest of either side.

Confidence-Building Measures

The successful application of the agreed group of confidence-building measures revealed their inherent ability to strengthen security. The process begun at the Conference on Security and Cooperation in Europe, the expansion and intensification of confidence-building measures, was put on the agenda by reality itself. The position of the Warsaw Pact countries envisages the need to extend these measures to broad-scale naval maneuvers close to the territorial waters of the European states in the future. The group of neutral and non-aligned states has also agreed that the confidence-building measures should extend to the maritime zones adjacent to Europe.

As a result of the Helsinki process, the idea of establishing a system of confidence-building measures was taken up and enthusiastically supported in other parts of the world, particularly the Pacific and Indian oceans, the Mediterranean Sea, the North Atlantic, and the Arctic Ocean, in the 1970's and 1980's. Proposals concern the most diverse measures—not only advance information about naval exercises of specific dimensions, but also the limitation of their number and of the regions where they are conducted, the prohibition of any kind of exercises in international straits and adjacent zones and in zones of intensive shipping, the limitation of the ships of various classes used in the exercises, etc.

Through the fault of the United States and other NATO countries, the so-called naval confidence-building measures are not part of any existing agreement. The document signed in September 1986 at the Stockholm conference—the only forum where the adoption of these measures was discussed on the practical level—records the Western concept of the narrow "functional connection" between activities on land which must be reported in advance and naval activity. According to this concept,

the actions of amphibious assault forces taking part in infantry exercises require advance notification.

Judging by remarks by American officials and non-government experts, there are three arguments in support of this position: First of all, ground troops, and not naval forces, pose the greatest threat in the kind of surprise attack the confidence-building measures are supposed to prevent; second, going beyond the "functional connection" recorded in the final document would eliminate the objective basis for the precise definition of the particular types of naval exercises that pose a threat to European security; third, confidence-building measures based on a broader interpretation of the "functional connection" will not be effective because they cannot be verified reliably. Now we must take a look at how these objections to naval confidence-building measures stack up against the facts.

The United States' own experience in World War II refutes the first argument. It was precisely Japan's surprise attacks on Pearl Harbor and the Philippines from the sea in 1941 that led to such huge losses on the American side that the U.S. command had to assume the strategic defensive in the Pacific theater of military operations. It was not until the beginning of 1944 that the American Armed Forces achieved a position of substantial superiority and were able to launch a strategic offensive in the Pacific.

The present U.S. naval strategy leaves no doubt that it puts the emphasis on preparations for a surprise attack. It is seen as a guarantee of the success of U.S. and NATO naval operations, which have been assigned, as I mentioned above, a leading role in ending a military conflict in Europe on "favorable" terms for the bloc.

The Warsaw Pact countries are completely justified in seeking agreements on the advance warning of separate exercises by naval forces equipped with nuclear weapons and representing a striking component of the armed forces in terms of their combat potential. The removal of naval activity from the sphere of verification would conflict with the basic purpose of the confidence-building measures—to defuse the situation by lessening the threat of surprise attack.

The arguments which can be loosely categorized as technical do not seem any more valid: How can exercises threatening only Europe be distinguished? It is true that not all of the exercises conducted by the United States and the NATO countries in the Atlantic or the Mediterranean apply only to the situation in Europe. This bloc's naval forces are perfecting combat operations against states in the Third World as well. It appears, however, that just the simple fact of geographic proximity to the European continent would serve as sufficient grounds to extend the requirement of advance notification to these maneuvers.

It is easy to guess why the NATO countries would not want to disclose exercises for the defense of ocean and sea lanes. Because this is the main purpose of many

naval exercises, confidence-building measures would not extend to a significant portion of the bloc's maritime activity. These exercises, however, have the most direct connection with European security and the maintenance of the military balance on the continent because military transports by sea, according to NATO strategy, are of decisive importance in supplying the armed forces of the alliance with strategic reserves, ammunition, and materiel in the European theaters of military operations.

Verification is a more complicated technical problem than the definition of the parameters of naval exercises subject to advance notification. It could become just as big a stumbling-block as the verification of SLCM limits, if not a bigger one. The issue of verifying the observance of agreements has special dimensions in the case of naval exercises. Here are just a few of the distinctive features of naval exercises. Ships taking part in exercises operate in the open sea, governed by international law rather than national legislation. They can be scattered over a huge area (the ships of a single carrier task force, for example, are deployed in a region with a total area of 10,000 square miles). The ships taking part in exercises can include submarines, and operational secrecy is their main characteristic.

Technical experts are just beginning to analyze and unravel the knot of problems connected with the verification of confidence-building measures of this type. It is already clear that the success of their difficult job will depend primarily on the presence of substantial reserves of goodwill on both sides, more forthcoming data on military operations and personnel numbers, and patience, because quick results are out of the question.

It is true that if naval confidence-building measures are interpreted as more than the mere provision of advance information about exercises, and if the range of confidence-building measures in the sea is gradually broadened, some agreements could be concluded now. The outlines of a danger which began to be considered a comparatively short time ago—the start of unauthorized military operations—have become increasingly distinct. This possibility seems particularly real when the naval forces of opposing sides come into direct contact, sometimes in a crisis situation. A multilateral agreement on the prevention of incidents at sea (the USSR has concluded such bilateral agreements with several countries in the past) would deliver Europe from a threat which might be more realistic than a surprise attack.

Glasnost in Naval Activity

Until recently measures in the naval sphere have remained on the periphery of the process of arms limitation and the consolidation of security. For completely understandable reasons, priority was assigned to the curtailment of the nuclear arms race and the elimination of other weapons of mass destruction. The expansion of the process to include conventional arms and regional security naturally raised the question of limiting naval activity and the combat potential of naval forces. It is

here, however, that the struggle for disarmament has encountered resolute and easily predictable resistance, especially from the United States.

It is probable that it cannot be surmounted with the traditional method of *quid pro quo*, because this concerns an advantage which, in the United States' opinion, an opponent can never erase with a mere buildup of naval strength. Incentives for change in the American position on naval forces will have to come from someplace other than the naval sphere. This seems to be corroborated by the fact that the limitation of naval forces and their activity would conflict with American ideas about the importance of military strength in foreign policy and with the views of U.S. ruling circles on the conditions essential for American domination of the world community. This might sound too pessimistic, but it appears that a decisive—I repeat, decisive—breakthrough in the resolution of the naval problem could be secured only with changes in the U.S. foreign policy philosophy. The ongoing process of nuclear disarmament, the considerable lowering of the level of military confrontation in Europe, and the establishment of a fundamentally new political atmosphere in East-West relations—these are the factors which will necessitate serious adjustments in the American approach to international relations and security issues and simultaneously pave the way for the reduction of military rivalry in the world ocean.

It is probably already within our power, however, to create a more favorable situation for the involvement of the United States and its allies in a productive dialogue on naval issues. To do this, we will have to apply the principles of the new political thinking to our own views on the military confrontation in the world ocean and on requirements in the naval sphere. On the psychological level, for example, we should wonder whether our remarks—which are accurate on the whole—about our longer maritime borders than those of the United States might be interpreted as unjustifiable ambitions for naval superiority. Are we guilty of applying a double standard when we justify the presence of Soviet naval ships in distant waters because our shipping lanes run through these zones, while refusing to accept the same argument from the other side? Is it fair to describe installations as U.S. naval bases when we define identical installations as material and technical supply points or points for the replenishment of food and water supplies?

It is obvious that the application of the principle of reasonable sufficiency to the structure of our own navy and to its operational deployment in the world ocean warrants serious consideration. In view of the distinctive geostrategic position of the United States and the globalist basis of the plans drawn up by the American naval command, the concept of parity, which is applicable to a certain extent—for example, on the strategic level or to the European situation—probably “will not work” in the naval sphere in the beginning. It is a significant point that the cost of mistakes in defining naval requirements might be particularly high. It is impossible to quickly

make up for lost time during the course of military operations: Naval ships take years to build. Navies which are too big and include large aircraft carriers, on the other hand, are viewed as something like the calling card of an expansionist policy. Besides this, their maintenance puts a heavy burden on the economy.

It is time to institute the long-overdue extension of glasnost to the politico-military, and especially naval, activities of the USSR, which not only might take the wind out of the sails of those who love to profit from references to the "Soviet threat," but will also be an important move in establishing a climate of trust in international relations. In particular, the USSR's reluctance to publish information about naval organizational development seems genuinely archaic. Everyone knows that the lengthy construction of naval ships in a few shipyards, their launching, and their testing cannot be concealed from the other side's surveillance equipment. The regular publication of objective and sufficiently complete data on the ships of the USSR Navy would clearly demonstrate the sincerity of our intentions to lower the level of military confrontation in the seas and oceans considerably.

The proposal the Soviet Government addressed to the NATO countries in July 1988, inviting them to send observers to the exercises of the Baltic Fleet of the USSR Navy, was a step in the right direction for the establishment of glasnost in the naval sphere. We can only regret the friendly refusal of the invitation by our Western partners.

In July 1989 the Soviet Union made another move based on serious practical considerations. It allowed the guided missile cruiser "Slava," carrying a standard cruise missile with a nuclear warhead, and two other ships to be used in a joint Soviet-American experiment for the remote verification of the presence of nuclear weapons on board. Even though the successful conclusion of the first experiment was interpreted in Washington as insufficient proof of the existence of a reliable verification mechanism, the Soviet Union might have achieved something more important: It demonstrated its willingness to make the move to naval limitations—and not just verbally, but by taking action. Finally, this marked the beginning of Soviet-American cooperation in the perfection of verification procedures, which will be so important in changing the U.S. assessment of prospects for naval verification.

In other words, measures helping us reveal and surmount obsolete stereotypes—our own and those influencing our negotiating partners—can make a real contribution to the consolidation of security in the world ocean.

Footnotes

1. K. Dunn and W. Staudenmaier, "Strategic Implications of the Continental-Maritime Debate," Washington, 1984; R. Komek, "Maritime Strategy or Coalition Defense?" Cambridge, 1984.

2. THE NEW YORK TIMES, 4 November 1987.

3. UNITED STATES NAVAL INSTITUTE PROCEEDINGS, January 1986, pp 66-71.

4. PRAVDA, 25 March 1986.

5. THE NEW YORK TIMES, 20 June 1986.

6. FOREIGN AFFAIRS, Fall 1988, pp 62-63.

7. UNITED STATES NAVAL INSTITUTE PROCEEDINGS, June 1987, p 31.

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ECONOMIC SURVEYS

Development of Ferrous Metallurgy in United States and USSR

904K0004B Moscow SSHA: *EKONOMIKA, POLITIKA, IDEOLOGIYA* in Russian No 11, Nov 89 (signed to press 20 Oct 89) pp 39-45

[Article by Aleksandr Fedorovich Myrtsyomov, State Prize laureate, candidate of technical sciences, and author of works on world ferrous metallurgy (retired)]

[Text] Right up to 1937—3 years after I had graduated from the metallurgical institute and began working at the Zlatoust Metallurgical Plant, I knew virtually nothing about American ferrous metallurgy. At the institute we had studied German, and in my last years I summarized and translated articles for DOMEZ (DOSTIZHENIYA METALLURGII DOMA I ZA RUBEZHOM). I frequently had to communicate with the Germans working at our plants, but I never even met any Americans.

The All-Union Spetsstal Trust was established and headed by I.F. Tevosyan. It was an association of enterprises specializing in high-grade metallurgy. At that time I headed the plant's research laboratory. In spring 1937 the trust decided to send a group of plant laboratory employees to England and the United States for 6 months for research. Because I was included in this group, the directors of our plant asked me to learn English as soon as possible. In 2 or 3 months I was able to read a little with a dictionary. Then I was called in again and was told that Deputy People's Commissar of Heavy Industry Pyatakov, a member of the Central Committee of the All-Russian Communist Party (Bolshevik), had been arrested in Moscow as a foreign spy and that all business trips abroad had been cancelled because of this. By that time, however, I was already reading American journals.

At the very end of the war the Ministry of Ferrous Metallurgy arranged for a group of specialists in high-grade metallurgy to go to the United States for 9 months to study American experience.

Long before I arrived in America, however, I had made its acquaintance second hand. During the war years I headed the Department of Specialized Production and was the deputy chief of a technical administration in the Ministry of Ferrous Metallurgy in charge of the development and production of new metal products for military use. In the second half of the war the United States began sending our country rolled alloy steel for the production of armor-piercing projectiles. When the American metal arrived at the Soviet projectile plants, inspectors found a dangerous defect with which our metallurgists were quite familiar—"flocules," or hairline cracks. I had once been actively involved in the development of the technology for the production of steel without flocules at the plant, and I was well aware that metal with this flaw could not be used for any critical purpose, and despite the acute shortage of metal, we had to reject it.

On the way to America, we learned something else about American ferrous metallurgy from the captain, who had inspected freighters of the "Liberty" class in the United States during the war. We knew that these ships were "cooked like pancakes" at that time. The captain said that the very first ship he inspected had fallen apart in the middle, but the Americans swore that the ship would be even more durable after the two halves had been welded back together. The Americans themselves did not see anything particularly upsetting about this because the ships were often sunk by the Germans anyway. We explained that one of the main reasons the ships were breaking apart was the low resilience of the rimming metal in the weld joints of the American ships of that time. Even before the war, our metallurgists already knew that only killed metal,

meeting high impact resistance requirements, could be used in welding. But this called for a special technology.

When our group arrived in the United States, we were sent to Warren, Ohio, to work for 4 months at a metallurgical plant of the Copperworld Steels firm. For the first 3 months we took turns working in various specialized shops. We spent the whole last month in the laboratory. It was there that we learned the reason for the flocules in their metal. After we left Warren, we spent about five months touring metallurgical plants and research institutes in the United States and Canada.

Of course, we learned a great deal there. They were eager to show us many extremely interesting and new technological processes, but we also gave the Americans a great deal of useful information, so that they could improve their technological processes with the use of our ideas. For example, we helped the Americans prevent flocules.

In the pre-war years we had developed effective technological processes and introduced them successfully at our plants, and works had been written and published. On several occasions when we discussed these matters with our American colleagues, they showed us English translations of the research findings of Soviet metallurgists.

The Era of Extensive Development

As we know, in the pre-war years and for many more years after the war, ferrous metallurgy in the USSR was far behind the United States in production scales. We caught up with American quantitative parameters around two decades after the war, but not with American quality, and this will be discussed below. Comparative production figures for steel and cast iron then and now are presented in Table 1.

Table 1.
Absolute and Relative Figures of U.S. and USSR Steel and Cast Iron Smelting

Categories	1913	1929	1937	1950	1960	1970	1980	1987
Steel, millions of tons								
United States	32	57	53	90	90	119	101	80
USSR	5	5	18	27	65	116	148	162
USSR as % of USA	16	9	34	30	73	98	147	203
Cast iron, millions of tons								
United States	31	43	38	60	61	83	62	41
USSR	5	4	14	19	47	86	107	114
USSR as % of USA	16	9	37	32	77	104	172	278

Source: "Narodnoye khozyaystvo SSSR za 70 let" [USSR National Economy in the Last 70 Years], Moscow, 1987; "World Steel In Figures," 1987.

Therefore, by 1970 our country had almost caught up with the United States in steel production and was even ahead of the United States in iron smelting.

In general, our countries used approximately the same techniques in cast iron production in the first postwar decades. Steel production was also the same on the whole from the standpoint of smelting methods in the pre-war years and in the first two decades after the war: The

open-hearth process accounted for around 80-90 percent of total production in both countries. Just before World War II, the USSR moved far ahead in the smelting of high-grade steels and expanded electrosmelting capacities accordingly. We were far ahead of the United States and Germany in proportional quantities of electric steel.

From 1940 to 1945 the United States augmented the capacities of arc furnaces dramatically and increased the

yield of electric steel to 4.2 million tons a year. In contrast to this, our country had to reduce the production of all metals, including electric steel, considerably during the war years. As a result, we had to smelt much of our alloy steel in open-hearth furnaces, although it is normally smelted in electric furnaces in all countries. In the first years of the war we were already able to start up all of the electric furnaces which had been moved to eastern plants from southern and central plants at the beginning of the war. Because of this, by the end of the war we had almost completely restored the production of electric steel—921,000 tons in 1945.

Significant quantitative and qualitative advances were made in our ferrous metallurgy in the decade and a half or two decades following the war. Today some people say that simultaneous quantitative and qualitative development is impossible. This might be true today, but experience in development then, at least in ferrous metallurgy, did not support any such categorical assertion.

As a matter of fact, the quantitative volume of ferrous metal production was restored in the USSR in 1948. Cast iron production was 3 times as great in 1960 as in 1940, steel output was 3.6 times as great, and the output of rolled metal products was almost 4 times as great. Intensive methods of development were used on a broad scale and retooling was accomplished during those same years. In 1950, for example, the first three blast furnaces with shaft gas pressure began operating, and in 1958 the USSR already had 69 blast furnaces, producing 83 percent of all the cast iron. Whereas in 1940 each cubic meter of blast furnace working volume in our country produced an average of 840 kilograms a day, in 1958 the figure was already 1,290 kilograms—i.e., 1.5 times as high. The average daily steel yield per square meter of open-hearth furnace area rose from 4.24 tons in 1940 to 7.69 tons in 1960, or by more than 80 percent.¹ It is a significant point that Japan was advancing more quickly and more vigorously in ferrous metallurgy than the USSR and the United States in the quantitative and qualitative sense.

New and highly effective processes were developed and introduced in steel production in the USSR during that period: the basic oxygen process and continuous casting. Development in these two areas was quicker in our metallurgy than in the United States. For several years we were catching up with American metallurgists in the proportional use of the most effective smelting processes and did not begin falling behind until later decades.

Intensive Development

Then USSR Minister I.P. Kazanets went to the United States in 1973 to find out what he could about ferrous metallurgy there. He published a book in 1975,² in which he stressed that "in 1974 the United States, just as the other developed capitalist countries, was stricken by a new economic crisis." He did not notice that this was not a crisis, but a turning point, a transition from extensive to intensive development in ferrous metallurgy. He paid

no attention, for example, to the establishment of controlled rolling for the production of high-strength steel. Later, when prospects for the development of ferrous metallurgy were discussed at a meeting of the scientific and technical council of the USSR Ministry of Ferrous Metallurgy and I suggested that the intensive method be substituted for the old extensive method, Comrade Kazanets left the room, apparently deciding that none of this could be of any interest to him.

In my article "The Intensification of Production in Ferrous Metallurgy in the Capitalist Countries" a decade ago, I was already saying that "ferrous metallurgy in the capitalist countries is moving more and more definitely toward reorientation. It is not being developed by augmenting the absolute scales (or weight) of the output of ferrous metals, but primarily by enhancing the use value of metal products. The continuous augmentation of the number and size of the basic metallurgical assemblies has ceased."³

No one took my advice, although many people unofficially expressed enthusiastic agreement with my views.

The reorientation of metallurgy in the capitalist countries picked up speed in the middle of the 1970's. The main cause of this was the energy crisis. It became obvious that fuel could no longer be used in the same quantities as before. In ferrous metallurgy this meant that proportional metal requirements per unit of finished product had to be reduced substantially in metal working and that proportional expenditures of fuel and energy per unit of metal produced also had to be reduced.

The main objective at that time consisted in the development of new production technology, the modernization of equipment, and the organization of high-strength steel production. This would first entail the controlled rolling of sheet metal and merchant steel out of low-alloy and micro-alloy metal, followed by the use of mild and plain-carbon metal to derive diphasic, pliable, and high-strength sheet steel. There was a chance of producing rolled products with a durability rating of 60-80 kgs/mm² instead of the familiar 30-40 kgs/mm² for low-alloy steel. This also resulted in high-strength rolled products which were more pliable and could be used more widely in metal working.

I can cite several examples. An analysis of the conditions of vehicle manufacture and material requirements indicates that the use of sheet steel in place of merchant metal and bulk casting in much of the structure reduces its weight (by an average of 20-40 percent). Besides this, scrap in metal working is reduced by no less than 10 percent. The weight of the manifold of an 8-cylinder gas engine manufactured with sheet steel 1.5 mm thick in the United States is 6.8 kg, whereas one of cast iron with a wall 4.7 mm thick would weigh 24.9 kg. In other words, metal requirements are reduced by 72 percent. The augmentation of the strength of steel used in the U.S. automotive industry from approximately 35 to

50 kgs/mm² between 1973 and 1985 reduced the weight of each vehicle by 70 kg. The proportional metal requirements of the gross national product in the United States decreased from 81 tons per 1 million dollars in 1970 to 49 tons in 1983. In France proportional steel consumption per 1 million francs of product in all of the metal-using branches of the economy decreased by 45 percent between 1962 and 1982.⁴

In addition to reducing metal requirements in consumer branches, this creates substantial opportunities for the more economical use of steel in metallurgy. Continuous casting produces from 150 to 200 more kilograms of finished rolled products from each ton of steel than ingot casting. Continuous casting now accounts for 85-95 percent of all the steel smelted in the overwhelming majority of capitalist countries and some developing countries. As Table 2 shows, ferrous metallurgy in the United States still has a long way to go before it can catch up with the most advanced countries in this respect. The USSR, however, is even further behind.

In recent years the percentage of metal billets derived through section casting has been declining in the capitalist countries. Usually, less than 1 percent of all the steel smelted in the country is used for these. As a result of both of these factors (more continuous casting and fewer castings), the most advanced countries are using around 1.1 tons of molten steel or even less for each ton of merchant bar products. The United States has to use slightly more—still around 1.16 tons of steel—because of the lower percentage of continuous castings.

Table 2.
Proportional Use of Continuous Casting
in Steelmaking, %

Countries	1960	1965	1970	1975	1980	1987
USSR	0.7	1.3	4.3	6.9	10.7	16.1
United States	0.02	0.07	3.8	9.1	20.3	59.2
Japan	0.2	no data	6.7	31.1	59.5	93.0
FRG	—	no data	8.3	24.3	46.0	88.9

Source: STAHL UND EISEN, 1988, No 10; "Narodnoye khozyaystvo SSSR za 70 let"; "SSSR v Tsifrah v 1987 g." [The USSR in Figures in 1987].

Proportional energy consumption has been reduced considerably in ferrous metallurgy in the capitalist countries. The most satisfactory results have been recorded in Japan.

For a fairly long time the United States was far behind several other countries in the level of equipment and the establishment of modern facilities in ferrous metallurgy. It took more than 10 years to complete the first phase of construction, for example, on the only integrated metallurgical plant built in the 1970's, in Burns Harbor (Indiana). It was naturally obsolete in many respects by the time it opened.⁵ This is even more true of our country.

Comparison of Soviet and U.S. Ferrous Metallurgy

Whereas the equipment and technology of metallurgical production in the USSR and the United States were similar in most respects in the first postwar years, in the next two decades the Americans advanced far beyond us. It is probable that the most significant difference today can be found in the structure of steelmaking (see Table 3).

Table 3.
Proportional Use of Progressive Smelting
Processes in USSR and United States, %

Categories	1958	1965	1970	1975	1980	1987
Basic oxygen process						
USSR	2.1	4.4	17.2	24.6	29.3	32.8
USA	1.3	17.4	48.2	61.6	59.4	58.3
Electrosmelting						
USSR	8.2	9.4	9.3	9.9	10.5	14.3
USA	8.1	10.5	15.1	19.4	29.7	37.7

Source: "Narodnoye khozyaystvo SSSR za 70 let"; "SSSR v tsifrah v 1987 g."; STAHL UND EISEN, 1988, No 10.

The decisive factor in our country's tendency to lag so far behind in continuous casting is the prevalence of archaic open-hearth mills. The effective coordination of open-hearth furnaces and continuous casting equipment would be impossible: Smelting takes from 6 to 8 hours in open-hearth furnaces, but continuous casting takes only around 1 hour. It is probably an even greater drawback, however, that molten metal has to be refined outside the furnace before continuous casting, and it would be inefficient to combine this treatment with the open-hearth process.

In contrast to our exceptionally slow augmentation of continuous casting capacities, the United States incorporated this kind of equipment with a capacity of 10 million tons of steel a year and refining assemblies just in 1986.⁶ In 1987 several more such units with powerful teeming assemblies were built, several units were modernized, and new equipment continued to be installed.⁷

As a result, our domestic ferrous metallurgy is still producing mainly steel which was already obsolete in the qualitative sense a few decades ago, whereas ferrous metallurgy in the United States is beginning to make steel products meeting current requirements and capable of competing successfully in the world market.

The output of steel in 1987 in the United States was 41 percent below the peak 1973 figure, with total consumption of around 100 million tons including imports, whereas steel production in the USSR is still growing.

Heavy cast iron and steel castings are still being manufactured and used on an extremely broad scale in the Soviet Union. In 1985 the USSR produced more than 6 million tons of cast steel, whereas the United States made less than a million tons. Thick-walled section castings require a great deal of machining. Furthermore,

in comparison to the United States, we are making little use of such efficient operations as sheet metal stamping, heading, upsetting, and others, and we do not produce enough flat metal, especially rolled sheet steel for deep forging. As a result, our national economy annually turns more than 10 million tons of metal into shavings—more than all of the capitalist countries combined.

A comparison of the structure of rolled steel products points up a much higher percentage of the more efficient types of products in the United States.

The high-quality steel sheet with good coatings used in the United States, for example, secures the durability of vehicle bodies for 5 years, while we have to spend so much money and energy to fight vehicle corrosion. Because of our extremely low output of steel canning material, we have to use glass containers on a broad scale. Proportional energy expenditures in the production of disposable glass bottles, however, are more than 4.5 times as high as the indicator for tin cans.

Although the production of higher-quality metal products in the United States is more labor-intensive than our rolling, labor productivity in American metallurgy is rising much more quickly than in Soviet metallurgy.

The Near Future

It seems to me that possible increases in steel consumption in the United States will be covered in the future by the production of higher-quality rolled steel, and not by smelting additional quantities of cast iron and steel. The Americans will cover the demand for square and linear meters by increasing the strength of rolled products while reducing their thickness and weight. They will improve the technology and organization of production during different stages of smelting, casting, and heating operations. Within the next few years the United States will already be deriving larger quantities of rolled products from the same amount of steel by increasing the proportional use of continuous casting—to around 90-95 percent in the next 3-5 years.

A decree was published in our country on 23 July 1987 on the "Metal Requirements" program, envisaging the reduction of relative metal requirements to half the 1985 figure by the year 2000. I believe that this decree was unrealistic from the very beginning. We can already say quite definitely that the declared goal will not be attained under any circumstances.

The 4th year of the 12th Five-Year Plan is coming to an end. Between 1985 and 1990 the proportion accounted for by progressive methods of steel smelting was supposed to be increased by 11.6-14.6 percent, but in reality it will increase by 5-6 percent at the most. According to the decree, the volume of continuous steel casting was supposed to increase from 21 million tons to 48 million during the 5 years—i.e., by 27 million tons. The increase in the first 3 years has been only 6 million tons, and we can expect an increase of another 5 million or so in the last 2 years. This means that the total figure for the 5 years will be only 11 million tons.

The intensive development of better processes and equipment for the combination of continuous casting and rolling methods has taken place in many developed countries in recent years.

The USSR is researching different technologies and designs for the direct combination of the continuous casting of steel with subsequent continuous rolling in a planetary rolling mill for the derivation of reels of steel rod wire; the development projects are being conducted by several institutes and plants in different branches of industry under the supervision of the Ministry of Metallurgy. The plan to combine casting with rolling should produce substantial technical and economic advantages. Experimental industrial equipment is to be installed in six metallurgical plants.⁸ The drawbacks of the plan include the fact that this technology can only be used in the manufacture of a small portion of rolled products, namely rod wire. The total output of this wire in any country represents only 5-8 percent of all rolled products. Furthermore, planetary rolling will probably have to be used for alloy steel, and there is relatively little demand for it. Equipment of this kind is expected to produce around 80,000 tons in a year, and this might be expedient in this case. The wire usually made of carbon metal is manufactured on simpler modern rod mills with an annual output ranging from 500,000 to 1 million tons. Therefore, the development of complexes with continuous casting equipment and planetary rolling mills will not make the extensive use of the process for the derivation of large quantities of rolled steel products possible.

In the capitalist countries rolled plate and sheet steel represent most of the output of rolling mills—usually 60-65 percent of the total. This is why their metallurgists are concentrating more on the combination of the continuous casting of steel in conventional slabs with hot rolling in the traditional wide-strip mills in strips, or continuous casting in thin slabs with strip rolling in a mill with a simpler design, or, finally, direct casting into thin strips or bands, without any rolling at all. An industrial production complex with equipment for the continuous casting of steel in 50 mm slabs, adjoining a four-stand wide-strip mill for the derivation of 820,000 tons of 2.5 mm strip a year, has been built at the new mini-plant of the Newcor firm in the United States and began operating in the first half of 1989. Within the first months of operation, productivity had reached virtually the annual volume—500,000 tons of strip, or around 60 percent of projected capacity. Experiments in the short-term continuous casting of thin slab without the addition of rolling have just begun in the USSR. In the United States considerable effort is being made to continue improving rolling and finishing operations, partly to enhance the precision of dimensions and the quality of the surface and texture.

If our ferrous metallurgy could manufacture rolled steel products meeting present quality and precision requirements, no more than 110-120 million tons of steel would have to be smelted each year to cover demand in the USSR up to the year 2000, instead of the anticipated 170 million tons. Furthermore, this would make the reduction of

environmental protection expenditures by around one-third possible, as well as the reduction—and this is particularly important—of the pollutants remaining even after air and water purification by another third. All of this, of course, will require the radical transformation of our ferrous metallurgy.

Footnotes

1. "Chernaya metallurgiya SSSR" [Ferrous Metallurgy in the USSR], Moscow, 1967.
2. I.P. Kazanets, "O chernoy metallurgii SShA" [Ferrous Metallurgy in the United States], Moscow, 1975.
3. EKO, 1978, No 1, pp 184-206.
4. A.F. Myrtsyomov, "Intensivnyy put razvitiya chernoy metallurgii kapitalisticheskikh stran" [Intensive Development of Ferrous Metallurgy in Capitalist Countries], Moscow, 1985, p 81—Ed.
5. IZVESTIYA AKADEMII NAUK SSSR. METALLY, 1972, No 6, pp 19-25.
6. SSHA: EKONOMIKA, POLITIKA, IDEOLOGIYA, 1988, No 1, pp 89-96—Ed.
7. IRON AND STEEL ENGINEER, 1988, No 2.
8. NAUKA I ZHIZN, 1989, No 3, pp 8-12.

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NOTES AND COMMENTS

Modeling Conventional Arms Limitation and Reduction

904K0004C Moscow SSHA: EKONOMIKA, POLITIKA, IDEOLOGIYA in Russian No 11, Nov 89 (signed to press 20 Oct 89) pp 52-56

[Article by Aleksey Alekseyevich Vasilyev, doctor of historical sciences, chief scientific associate at Institute of U.S. and Canadian Studies, and member of Soviet delegation at Vienna talks]

[Text] There are many reasons for the complexity of conventional arms and armed forces limitation and reduction talks. The most important include the diversity and asymmetry of arsenals and the need to build a structure of armed forces and arms with a higher level of stability—i.e., to reduce the possibility of surprise attacks or broad-scale offensives by opposing sides. The world public, including the scientific community, has displayed great interest in the talks and, in particular, in the study of ways of reducing military tension in Europe by modeling the process of armed forces and arms reduction. The study of different options could provide information which could be of great help in solving the problem.

The modeling of reductions in armed forces and conventional arms represents one of the approaches to their comparison and to the calculation of the actual balance of power. In this respect, it is one of several methods of assessing the balance, which include:

Static methods¹ based on comparisons of the quantities of arms by category without consideration for their qualitative characteristics;

Quantitative-qualitative methods in which the static balance is adjusted to reflect differences in the qualitative features of different types of arms;

Dynamic methods of comparison based on the mathematical modeling of different scenarios of warfare. The simplest dynamic models, which are usually based on Lanchester's equations,² assess changes in the balance of power without considering the advancement of forces to the zone of contact. More complex models take this possibility into account, as well as the movement of forces through the theater of military operations, the ability of the sides to attack lines of communication, the forces deep within enemy defenses, etc.

At this time the most widely used methods are probably the static comparisons. They also lay at the basis of the Vienna talks by 23 states on conventional arms and armed forces reduction. It is probably understandable that the sides temporarily avoided quantitative-qualitative comparisons in order to conclude an initial agreement on the reduction of the five categories of arms and personnel discussed at the talks to equivalent lower levels. The mandated achievement of a higher level of stability indicates that broad scope exists for the use of analytical methods to support the negotiation process, including mathematical modeling.

The modeling of armed forces and arms reductions is a process consisting of the modeling of different scenarios of armed conflicts with different reduction options and the choice of the options securing the ability of either side to conduct effective defensive operations under any form of attack by the other side.

What difficulties does modeling entail? Why is this method being used on such a modest scale when it appears that the development of computer technology should have led to its much more extensive use? When people answer this question, they generally refer to the inadequate computer experience of the negotiators. Although this is an important factor, there is a deeper problem in the use of modeling to analyze the process of disarmament, which would entail significant political changes and, consequently, tremendous responsibilities.

In our opinion, the most difficult problems arise when the combat potential of the sides has to be expressed in the form of a limited set of numerical data. In Western, particularly American, literature, combined indicators of the combat potential of different types of arms and combat units are used widely for this purpose. They are used to assess the division equivalents (DE) employed by

the authors of various studies. It must be said that there is no single approach to the choice of calculation procedures even within the Pentagon. The U.S. Army uses methods which have been rejected by the Air Force and Navy. This makes it all the more difficult to choose an approach satisfying the different parties in negotiations. The absence of a single set of calculation procedures opens the door to subjective assessments, in which a pseudo-scientific approach is used to conceal attempts to substantiate political arguments which are frequently quite far removed from the truth. In this case, the authors of the calculations must take responsibility for various omissions which might contribute to false perceptions of the overall balance of military power on the continent. A false set of recommended options for the reduction of armed forces would be a direct result of this distorted initial perception. In other words, this could be a case of the conscious or unconscious manipulation of the talks, of political decisionmaking, etc.

"Conventional Arms Control Revised: Objectives in the New Phase,"³ a well-known RAND Corporation study, provides an example of this.

The authors list firepower, mobility, and survivability as the indicators of the combat potential of the armed forces of the different sides. The choice of these three characteristics of the potential of forces on the division level and above clearly indicates the authors' wish to limit the number of major parameters in order to single out the ones underscoring the superiority of the Warsaw Pact. The authors leave communications, data collection and processing, electronic warfare systems, and other parameters out of the analysis. This approach seems all the more odd in view of the fact that contemporary American and West European military publications attach special importance to these systems. For example, U.S. Secretary of Defense Weinberger was already writing about this in his report to the Congress on the budget for fiscal year 1983. It is no secret that the NATO armies have made huge investments and have developed numerous new systems in this area.

The biggest drawback of the traditional American approaches to the calculation of division equivalents is their failure to consider the firepower of air forces. Another important mistake can be found in a more careful comparison of the DE of average Soviet and U.S. divisions used by the RAND authors. It is no secret that there are substantial differences in the size and level of readiness of Warsaw Pact and NATO divisions, and these must be taken into account.

The United States usually uses the U.S. motorized division as the basic unit for the standardization of DE calculations. In this case, according to the RAND authors, the corresponding DE for the Warsaw Pact countries might be equivalent to 0.8. Other data on the Warsaw Pact DE are also cited in American studies. In particular, in W. Mako's work "U.S. Ground Forces and the Defense of Central Europe," the DE of the average Warsaw Pact division is equivalent to 0.65. Even this

seemingly negligible difference leads to substantial deviations from the results obtained by the authors of the previously mentioned report when they assess the balance of NATO and Warsaw Pact armed forces.⁴

These mathematical exercises, however, are not the main thing.

The very procedure of employing the DE in the flawed form in which it is used in the United States is extremely questionable. It does not link the assessment of the armed forces and arms making up the division with its deployment, operational strategy, and level of readiness. It does not take a specialist to see that the potential of a division will differ radically, even with no change in equipment, depending on how far it is deployed from the theater of operations and on whether it participates in offensive or defensive operations.

Besides this, objective scientific analysis calls for consideration of the level of anxiety on both sides. Modeling offers this opportunity in principle. The fact that several Western studies, such as the previously mentioned RAND report, review only scenarios beginning with a Warsaw Pact attack on NATO and invariably presuppose offensive operations by Warsaw Pact divisions and defensive action by NATO divisions, is not the result of the research methods, but simply of the authors' political biases. Obviously, if a study is intended to produce objective results, it must also consider scenarios arousing the anxiety of the other side—an attack by the NATO countries on the Warsaw Pact. It is easy to predict that the conclusions of this kind of study would be completely different.

These flaws in the known Western methods necessitated significant changes in the approach of Soviet specialists to the modeling of theater-based military operations for the purpose of revealing the top priorities in the reduction of armed forces and arms in Europe. These changes affected the quantitative-qualitative methods of assessing the balance of military power and the dynamic methods—i.e., they affected the models directly.

The changes in quantitative-qualitative methods consisted in the calculation of parameters not taken into account in known American studies (communications, the fire support of attack aircraft, etc.). This produced a more balanced and objective assessment of the alignment of forces. Unfortunately, we must admit that the absence of information about the characteristics of some types of Warsaw Pact arms requires the use of Western sources in some cases. The work was facilitated to a considerable extent, however, by the publication of the statement by the Warsaw Pact Committee of Defense Ministers "On the Numerical Balance of the Armed Forces and Arms of the Warsaw Pact and North Atlantic Alliance in Europe and Adjacent Waters" in PRAVDA on 30 January 1989.

The traditional approach based on Lanchester's theory was developed and supplemented by the construction of a model including the advancement of reserves to the theater of operations from more distant echelons and the

rear (with adjustments for delays), as well as the possible strategy of the other side for the maximum complication of this advance.⁵ In addition to scenarios of a NATO attack on the Warsaw Pact, scenarios of a Warsaw Pact attack on NATO were reviewed.

In addition, another model⁶ was developed to consider the possibility of changes in the position of the armed forces of the sides, their echelon structure, exchanges between echelons, an attack on deeper echelons, reinforcements from the rear, and an attack on lines of communication between the rear and the theater of operations. This model can be used to study the influence of a factor of military strategy as important as retreat for the purpose of reorganization on the balance of military power following a conflict.

The level of defense excellence was assessed on the basis of the distance the attacked side had to retreat within a specific timeframe. Losses can also be assessed at different speeds of advancement by the aggressor into the defensive side's territory.

The comparison of alternative structures of armed forces, deployment patterns, and reduction options is facilitated by the stability index, a non-dimensional quantity proportional to the relationship between the retreat distance in the case in question and the distance calculated for a previously stipulated situation (for example, the one which would result from a case of this kind with the balance of power recorded in the official data cited in the statement of the Warsaw Pact Committee of Defense Ministers).

In conclusion, I want to stress that any combat model entails the conversion of the complex and extremely diverse factors of warfare into a limited set of figures. The more complex the model, the stronger the sense that it is an accurate portrayal of the process of warfare and, as a rule, the farther this sense is from reality. Today there are no known approaches producing a reliable portrayal in quantitative form of such decisive factors of military operations as the disposition, mobilization readiness, and morale of troops, the skill of commanding officers, the level of perfection and reliability of equipment, etc. Although today's methods are developed on the most complex and most advanced computers, they are just as far from reality as those developed at the beginning of this century by English engineer Lanchester. It is no coincidence that many serious researchers in the West and in the Soviet Union are still using the methods of the beginning of our century or modifications of these methods in the justifiable belief that the range of probable error then and now is substantial and unpredictable.

What, then, is the purpose of these models? Disregarding the attempts to use models to exert pressure on the leadership of one's own country or allied countries and to substantiate somewhat unfair demands during negotiations, which is clearly the purpose of the RAND Corporation study, we must admit that models are a

useful supplementary tool for the assessment of the balance of military power during the examination of various reduction options. They cannot be a substitute for political decisions or replace trained analysts in the process of expert analysis.

Footnotes

1. The methods referred to as "bean counting" in Western literature.
2. Frederick William Lanchester (1868-1946) was an English engineer who published a work in 1916 entitled "Aircraft in Warfare," in which he proposed the equations that are still being used for the modeling of military operations.
3. J. Thomson and N. Gantz, "Conventional Arms Control Revised: Objectives in the New Phase," RAND Note, Washington, December 1987.
4. We must admit that the RAND authors conducted their analysis before M.S. Gorbachev announced the unilateral Soviet reductions in the United Nations and naturally could not consider their impact on the balance of Warsaw Pact and NATO forces. Calculations based on American methods of comparing conventional arms indicate that the USSR is planning the unilateral reduction of forces constituting from 17.5 to 20 equivalent divisions ("U.S. Ground Forces and the Conventional Balance in Europe," Washington, 1988, pp 14-15).
5. The author did this work with Professor A.A. Sheypak (Moscow Automotive Institute), who programmed the computer for the model calculations and performed the mathematical analysis.
6. The model software was developed under the author's supervision by Institute of U.S. and Canadian Studies post-graduate students V.A. Veselov, A.V. Nevedeyev, and A.A. Barinov.

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AT THE INSTITUTE OF U.S. AND CANADIAN STUDIES

United States and International Relations in 2000

904K0004D Moscow SSHA: EKONOMIKA, POLITIKA, IDEOLOGIYA in Russian No 11, Nov 89 (signed to press 20 Oct 89) pp 93-95

[Report by V.B. on symposium at Institute of U.S. and Canadian Studies, USSR Academy of Sciences, on "The United States and International Relations in 2000"]

[Text] This was the topic of a symposium in the Institute of U.S. and Canadian Studies of the USSR Academy of Sciences. It was attended mainly by young researchers from the Foreign Policy Department.

V.I. Batyuk began the discussion by expressing the opinion that within the near future U.S. ruling circles will be less concerned with expanding their international influence than with keeping it. The time when U.S. economic and technological superiority was indisputable is gradually receding into the past, and military strength does not have as much political clout as it did in the past. The American approach to the USSR will probably continue to be distinguished by a combination of attempts at constructive interaction and forcible pressure, accomplished by military and non-military means. Furthermore, Washington will strive to keep the process of armed forces and arms limitation and reduction from impeding the use of the scientific and technical advantages of the United States and its allies in the qualitative improvement of military potential. The speaker did not, however, exclude the possibility of the reduction or even the elimination, on certain terms, of the types of weapons which do not give the United States and its allies perceptible politico-military advantages (chemical weapons and surplus strategic arms). He went on to predict that there will be no changes in the next few years in the situation in which trade and economic, scientific and technical, cultural, and humanitarian contacts between the USSR and the United States do not play the deciding role in their interrelations. Even the complete elimination of the political obstacles Washington is known to have erected for the purpose of impeding Soviet-American trade and technological exchanges is unlikely to lead to their substantial growth unless the Soviet side makes a definite effort to integrate the Soviet economy into the world economy. Meanwhile, the prevention of the further proliferation of nuclear and chemical weapons, the settlement of regional conflicts, and the struggle against the international drug mafia and terrorism—this is far from a complete list of the problems which cannot be solved without concerted action by the USSR and the United States.

The participants in the discussion then concentrated on K.V. Pleshakov's speech, in which he analyzed the United States' relations with the "Third World." By the beginning of the 21st century the developing countries will represent an extremely complex and disturbing phenomenon, he said. Some will be dominated by right-wing or left-wing extremists. This is unavoidable because most of the "Third World" countries will have to deal with colossal socioeconomic problems, and their attempts to "solve" them usually lead to dictatorship and foreign policy ventures. If "radical regimes" should take over in Central America, the United States could find itself in a completely unfamiliar situation. The speaker did not even exclude the possibility of threats to U.S. national security. Under these conditions, he said, Washington will have to seek some kind of mutual understanding with the Soviet Union to solve their common problems. After he had assessed the possible parameters of this cooperation, K.V. Pleshakov expressed the opinion that it would be conducted within the framework of international structures, primarily the United Nations, and would take non-military forms—

economic and political sanctions, to the point of boycotts and, in extreme cases, blockades. He also said that several crises of the 1980's occurred only because the USSR and the United States did not reach the necessary mutual understanding on the problems of the "Third World." Furthermore, the United States is not wholly to blame for this.

The speaker went on to offer his definition of the term "great power": This is a state which, by virtue of its national strength (regardless of whether it is military or economic), can influence the development of the entire world community by peaceful means. In his opinion, by the beginning of the 21st century the most productive pattern for the development of the world community in general and the great powers in particular will entail politico-economic symbiosis, the interaction of markets, and the interpenetration of national economies. For this reason, the countries striving to retain the status of great powers solely through shows of military strength will cease to be great powers.

The next speaker was A.V. Frolov. He also began by discussing the phenomenon of the great powers. The American ruling elite now includes military strength, the ability to use force, and, in particular, the existence of allies among the distinctive attributes of a great power. On the basis of these criteria, the American definition of the great power would not include Japan—with its economic strength—or India and China—with their population. As far as the United States is concerned, the Soviet Union, with its diversified system of alliances, is still the only "superpower." And although the Americans do not regard the allies of the USSR as allies in the full sense of the term, the speaker said, they feel that there are only three real "power centers" in the world—the USSR, the United States, and the European Community, around which other states can certainly form larger groups. A.V. Frolov went on to analyze the situation in the Middle East, which was and is a region of strategic importance to the United States, and a region in which the United States will continue searching for allies against Moscow. Unfortunately, the USSR allowed itself to be dragged into this contest. This was productive at first, but later the fight for allies began to take up too much of our, and the Americans', energy and resources. The United States is still competing for allies, but without its earlier zeal, and people in Washington, the speaker observed, now believe that the center of gravity in Soviet-American competition in the region will move from the military to the economic sphere. This is where the United States has greater advantages. Frolov remarked that more people in the USSR are realizing that the USSR and the United States have a common interest in solving several problems in the Middle East. Islamic fundamentalism and the possibility of the proliferation of weapons of mass destruction and the means of their delivery in the region—all of these dangerous tendencies pose an objective threat to Soviet and American interests. Unfortunately, however, the obsolete stereotypes of "anti-imperialist solidarity" are still keeping

us from uniting our efforts with the West in the resolution of the region's most acute problems.

In his report on the United States and the "Third World," M.V. Braterskiy returned to the topic of Washington's interrelations with developing countries. In the United States, he said, there are at least three approaches to this issue. The advocates of "isolationism" believe that the "Third World" is of little importance to the United States because the main American interests are concentrated in Europe and Japan. They feel that the restructuring of the economy reduced the United States' dependence on raw materials imported from developing countries, and that the struggle with the USSR for a superior politico-military position in the "Third World" was counterproductive. The politicians and academics taking the "globalist" stance believe that the "Third World" is extremely important to the United States on the military-strategic and raw-material levels and that the United States has vital interests in the developing countries and should (and can) defend them. The third approach, based on the concept of interdependence, stems from the belief that the United States is too closely associated with many parts of the "Third World" in the commercial and military-strategic spheres (with the Middle East and the ASEAN countries, for example) to turn its back on them now. Nevertheless, according to this approach, the interdependence of the United States and the developing countries is secondary and incomplete in comparison with the interdependence of the capitalist centers, and the United States should not be overly concerned about the interests of the emerging countries. The last two concepts—globalism and interdependence—actually play the main role in U.S. foreign policy practices, but the isolationist attitudes cannot be completely disregarded either, especially now that the United States has to solve the problem of the national debt and pare down many of its commitments to the "Third World."

The symposium ended with I.V. Isakova's speech on a non-traditional area of Washington's foreign policy—participation in international efforts to protect the environment. At this time, she stressed, the environment is one of the main concerns of the mass political consciousness in the United States. The holes in the ozone layer, the disappearance of the tropical forests in Brazil—the region supplying oxygen to the planet—and other problems are seen as a possible threat to the state of the American habitat. Whereas the general public was distinguished by a high degree of "nuclear awareness" at the beginning of the 1980's, at the end of the decade it was replaced by "ecological awareness," in which the nuclear issue is only part of the problem. The improvement of Soviet-American relations allowed ecological issues to occupy a prominent place in political discussions, and in a new capacity. The present stage of the discussion of ecological problems is distinguished by the birth of the "code of ecological ethics"—i.e., a set of values in which the society and the conditions of its development and existence are viewed through the prism of environmental

protection. Furthermore, I.V. Isakova observed, the ecological ethics the United States adopts do not necessarily have to be ideal from the standpoint of other countries and peoples. Different concepts of this code are being discussed in the American ecological movement. The "ecological policeman" type of behavior, for example, will call for more aggressive action by the United States on the international scene and the exertion of stronger political, economic, and even military pressure on countries not observing the international standards of an ecologically clean economy; another type—"ecological messianism"—presupposes the need for financial assistance by the United States in the elimination of ecologically harmful production units and the improvement of the ecological situation, as well as the spread of the new ecologically clean technologies. The offer of assistance could be prompted by political considerations in the hope of maintaining and reinforcing American influence in the world.

On the whole, in the opinion of the institute Council of Young Scientists, the symposium was a spirited and interesting gathering. The discussion proved that the Foreign Policy Department has accumulated considerable potential for interesting ideas that might be useful in future studies of current issues in international relations by the institute's scientific associates.

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Chronicle of Soviet-American Relations (July-September 1989)

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[Text] July

1—American pianist Van Cliburn arrived for a concert tour of the USSR.

3-8—A session of the Customs Cooperation Council in Washington was attended by representatives from more than 100 countries, including the USSR and the United States. The incorporation of automation and computerization in the processing of freight and in the fight against drug trafficking and customs violations was the topic of discussion. The heads of USSR and U.S. customs had a meeting after the CCC session was over.

4—Chairman of the USSR Supreme Soviet M.S. Gorbachev sent his greetings to President G. Bush on the national holiday of the United States—Independence Day. Bush acknowledged the greetings in a reply. The U.S. ambassador in Moscow hosted a reception.

A published statement by a USSR Ministry of Foreign Affairs spokesman condemned the involvement of Pakistan and the United States in the military preparations for a "general offensive" in Afghanistan.

A concert tour by the Leningrad Theater of Opera and Ballet imeni S.M. Kirov began in New York.

Stamps of the All-Russian Society for the Protection of Nature and the American National Wildlife Federation were issued in the United States. This was the first joint action by these organizations.

Soviet and American scientists conducted a non-governmental experiment in the remote monitoring of nuclear weapons on military submarines near the port of Yalta in the Black Sea from the deck of a Soviet guided missile cruiser.

6—When M.S. Gorbachev addressed the Council of Europe in Strasbourg during his visit to France, he stressed that the USSR and the United States are “a natural part of the European international-political structure.”

The U.S. State Department refused to issue visas to a group of Soviet tourists on the grounds that it consisted of “trade-union officials.”

The last Pershing-1A ballistic missile was destroyed in the United States. Therefore, one type of nuclear weapon has been completely eliminated there in line with the INF Treaty.

10—An exhibit of drawings by Soviet children from the Art School in Moscow's Krasnopresnenskiy Rayon opened in the Teachers College of Columbia University.

10-31—A group of American medical experts from Alaska, studying human adaptation to conditions in the north, visited Magadan and Anadyr. The American scientists learned about the work of the Soviet public health care system.

15—In a WASHINGTON POST interview, Lt Gen V.P. Starodubov expressed the opinion that the future agreement on the reduction of conventional arms and armed forces could not be implemented before 1996-1997. The President of the United States questioned the finality of this judgment. Earlier, on 13 July, newsmen at a briefing in the pressroom of the USSR Ministry of Foreign Affairs were told that the official Soviet position on the matter is based on the assumption that an agreement could be reached in 1990 or even earlier if all participants in the talks in Vienna were to take a constructive approach to the negotiations; the implementation of this agreement, despite objective difficulties of a technical nature, could take place in 1992-1993. The TASS diplomatic correspondent asked the information office of the USSR Ministry of Foreign Affairs for an explanation. There he heard a reaffirmation of the Soviet Union's official position, stressing that the USSR has no intention of shelving the important matter of reducing military confrontation in Europe.

16—At the opening ceremonies of a Communist Party, USA, conference in New York, party National Chairman Gus Hall stressed that the changes occurring in the

USSR are clear evidence of the viability of socialist ideals. He expressed his support for perestroika and glasnost in the USSR.

The great-grandchildren of S.V. Rakhmaninov, who live in the United States, came to the USSR.

17—The first flight test of the B-2 strategic bomber was conducted in the United States.

18—The American Planetary Society suggested a Soviet-American manned flight to Mars.

American Secretary of Commerce R. Mosbacher announced the relaxation of restrictions on exports of some personal computers to socialist countries because they are available for acquisition in 11 other countries. Secretary of Defense D. Cheney did not approve of this decision.

Soviet Minister of Foreign Affairs E.A. Shevardnadze received U.S. Ambassador J. Matlock at his request. They discussed some aspects of Soviet-American interaction in the preparations for the international conference on Cambodia in Paris.

19—Chief G.I. Gerasimov of the Information Department of the USSR Ministry of Foreign Affairs reported at a briefing that the 11th round of Soviet-American consultations on the prohibition of chemical weapons, held in conjunction with the multilateral talks at the Geneva conference, had been extremely productive.

Commenting on the same round, U.S. State Department spokesman Baucher said that there had been no significant breakthroughs.

The U.S. Senate approved C. Pell's resolution on the situation in Nagorny Karabakh.

20—Member of the Politburo and Secretary of the CPSU Central Committee A.N. Yakovlev received J. Matlock at his request. They discussed some aspects of Soviet-American relations.

20-25—A team of exhibition basketball players from the United States, the Harlem Globetrotters, put on shows in the Moscow Palace of Sports in Luzhniki.

21-24—A detachment of Soviet naval ships under the command of Vice Adm I.V. Kasatonov, first deputy commander of the Northern Fleet, made a friendly visit to Norfolk (Virginia).

20-29—Marshal of the Soviet Union S.F. Akhromeyev was in the United States as the guest of the U.S. Congress. He addressed the Armed Services Committee of the House of Representatives of the U.S. Congress. In particular, he was the first to announce the plans for a 40-percent reduction in the USSR's tanks. On 29 July Akhromeyev had a meeting with President G. Bush, Secretary of State J. Baker, Secretary of Defense D. Cheney, and National Security Adviser B. Scowcroft. He

conveyed M.S. Gorbachev's greetings and best wishes, and Bush responded by sending his good wishes to the Soviet leader.

23—Citing an "informed source," the LOS ANGELES TIMES reported the formulation of a new U.S. strategy of nuclear warfare against the USSR.

26—The House of Representatives suggested cuts of almost 2 billion dollars in funds for the SDI program.

The elimination of the shorter-range SS-12 missiles was completed ahead of schedule in the USSR (the INF Treaty scheduled the elimination of this category of missiles for the end of November 1989).

27—A resolution calling for the consent of U.S. legislators in principle to the completion of the administration's program for the construction of 132 B-2 bombers in its entirety was rejected by a majority vote in the U.S. Congress.

Soviet Deputy Foreign Minister V.F. Petrovskiy had a meeting with U.S. Assistant Secretary of State J. Bolton to discuss the parameters of cooperation by the two countries within the framework of multilateral diplomacy, primarily in the UN system.

At a press conference, Chief R.A. Kuznetsov of the Visas and Registration Administration of the USSR Ministry of Internal Affairs reported significant problems with entry visas to the United States. In particular, as of 27 July 1989, 28,000 people were waiting for American visas.

28—George Bush addressed a conference of the National League of Families of American Prisoners and Missing in Southeast Asia and announced the U.S. Government's willingness to assist the USSR in acquiring information about Soviet citizens who had been taken prisoner or were missing in Afghanistan.

30—E.A. Shevardnadze had a meeting with J. Baker at the international conference on Cambodia in Paris.

August

1—PRAVDA published the replies of Army Gen D.T. Yazov, USSR minister of defense, to the questions of a TASS correspondent. In particular, Yazov reaffirmed the main objectives of future Soviet-American politico-military relations: the elimination of tactical nuclear weapons, the complete elimination of chemical weapons, and others.

Georgian filmmakers released a new documentary film, "The Mission," which was made almost entirely in the United States and documents the movement for solidarity with the young Soviet republic during the period of intervention.

2—The USSR Supreme Soviet sent a proposal to the U.S. Congress on a mutual moratorium on nuclear tests,

which could be the prologue to an agreement on a verifiable and comprehensive nuclear test ban.

E.A. Shevardnadze received U.S. Ambassador to the USSR J. Matlock at his request.

The Soviet-American consultations on Afghanistan, conducted by N.I. Kozyrev, ambassador at large, USSR Ministry of Foreign Affairs, and by J. Kelly, U.S. assistant secretary for Near Eastern and South Asian affairs, came to an end in Stockholm. Both sides agreed that the consultations had been useful and would be continued in the future.

3—A jury in a federal district court in Washington found a South Korean airline guilty of the loss of the Boeing-747 in the Soviet Far East 6 years ago.

4—Soviet First Deputy Foreign Minister A.A. Bessmertnykh received U.S. Charge d'Affaires J. Joyce at his request. They discussed aspects of bilateral relations and some regional problems.

In line with the INF Treaty (data for August 1989), 39 missile bases were eliminated in the USSR.

The latest system for the interception of ballistic missiles was tested in the United States as part of the SDI program.

4-8—In line with an agreement, a detachment of U.S. naval ships, consisting of the cruiser "Thomas S. Gates" and the frigate "Kaufmann" came to the port of Sevastopol on an official return visit.

5—The head of the Anglican Church in the United States, E. Browning, who had attended a meeting of the Central Committee of the World Council of Churches in Moscow, left the USSR.

7—The 11th round of Soviet-American talks on nuclear and space weapons came to an end in Geneva. The sides exchanged updated copies of prepared documents. With a view to the objective connection between the reduction of strategic offensive arms and the limitation of ABM systems, the Soviet delegation proposed that the treaty on the 50-percent reduction of strategic offensive arms include an article declaring it null and void in the event of violations of the ABM Treaty. The American side has not accepted this proposal yet.

In the verification sphere, the Soviet side suggested the broadest possible system of treaty verification. The head of the American delegation commented on the progress in the talks.

Rallies were held in Nevada and in Semipalatinsk Oblast as part of the international campaign for the universal cessation of nuclear tests.

8-18—A group of members of the House Armed Services Committee, headed by Chairman L. Aspin, came to the USSR as the guests of the Supreme Soviet. During their 10-day stay, the legislators met members of the USSR

Supreme Soviet committees on international affairs and on defense and state security and visited the Ministry of Foreign Affairs, the General Staff, several military installations, the space port in Baykonur, and other places.

9—The fourth round of Soviet-American talks on the limitation and cessation of nuclear tests came to an end in Geneva.

10—The U.S. Government requested the Soviet Union for permission to conduct an inspection on the territory of the USSR in connection with a Soviet troop exercise. The American side's request was granted.

11—Four members of an inspection team arrived in the USSR.

12—A.A. Bessmertnykh had a meeting with U.S. Secretary of State J. Baker in Washington to make the arrangements for the upcoming contacts on the foreign ministerial level.

The USSR took part in an air show in Oshkosh (Wisconsin).

14—Soviet Deputy Foreign Minister A.L. Adamishin received P. Born and G. Starr, public spokesmen from the United States who were in our country for the Moscow International Peace Marathon. They discussed the role of non-governmental organizations in the fight against hunger.

15—An editorial in THE NEW YORK TIMES advised the Bush administration to promote real progress in the Soviet-American talks on nuclear and space weapons.

16—The New York office of IZVESTIYA received a message from Lackenbach Siegel Marzullo & Aronson, an American firm, suggesting the organization of a contest for Soviet and American inventors.

17—The 12th round of Soviet-American consultations on the prohibition of chemical weapons began in Geneva as a supplement to the multilateral talks at the Conference on Disarmament. Verification was the focus of attention.

19—A 2-week Soviet-American conference on human rights at the University of California in Berkeley came to an end.

21—A.A. Bessmertnykh received U.S. Ambassador J. Matlock at his request. They discussed international regional issues, particularly questions connected with the conference on Cambodia in Paris and with the crisis in Lebanon.

22—In New York, Soviet circus performers began a tour sponsored by the American Express Company.

26—Chairman of the USSR Council of Ministers N.I. Ryzhkov received a delegation from the House Agriculture Committee of the American Congress in the Soviet Union.

27—The American Reader's Digest publishing firm decided to donate 135,000 dollars to the library of the USSR Academy of Sciences in Leningrad to replace collections damaged by a fire.

September

5—Member of the Politburo and Secretary of the CPSU Central Committee V.A. Medvedev received Director B. Gelb of the United States Information Agency when he came to Moscow for the opening of the "Design USA" exhibit.

9-17—On an unofficial trip to the United States, USSR People's Deputy B.N. Yeltsin was received by the President of the United States and the secretary of state.

11—E.A. Shevardnadze received U.S. Ambassador to the USSR J. Matlock at his request. They discussed several questions connected with the upcoming Soviet-American cabinet-level meeting in the United States.

13—The State Committee of the USSR for Public Education and the Phoenix Group International, an American firm, signed an agreement on the establishment of a joint venture to supply Soviet schools and VUZ's with computer technology.

21—During an official visit to the United States, E.A. Shevardnadze had a conversation with President G. Bush. He gave the President of the United States a message from M.S. Gorbachev with new ideas and proposals on security issues.

22-23—In Jackson Hole (Wyoming), E.A. Shevardnadze and Secretary of State J. Baker met for talks covering the entire range of Soviet-American relations. In particular, in line with an understanding reached earlier by M.S. Gorbachev and G. Bush, they agreed that the next Soviet-American summit meeting would take place in late spring and early summer 1990 in the United States.

There was a detailed discussion of the talks on nuclear and space weapons, including the ideas expressed in the letters M.S. Gorbachev and G. Bush had exchanged. The Soviet side suggested a new approach to the issues of ballistic missile defense and outer space. Both sides agreed that the Soviet approach would make the conclusion and implementation of a treaty on strategic offensive arms possible without concluding agreements on defense and space. To foster progress at the talks, the secretary of state announced that the American side would withdraw its proposal on the ban on mobile ICBM's at the talks on strategic offensive arms in connection with the U.S. Congress' decision on the financing of American mobile ICBM's. The sides also agreed that within the context of the level of 1,600 carriers, ballistic missiles would be defined as the combination of the missiles and their launchers, and that this would solve a problem of long standing. The foreign minister and secretary of state reaffirmed the goal of the quickest possible achievement of a comprehensive, verifiable, and genuinely global ban on chemical weapons.

The sides approved a special statement on chemical weapons, in which the quickest possible conclusion and enactment of a convention of this kind was called "one of the world community's highest priorities."

The minister and secretary said their delegations had approved an ad referendum protocol to the 1976 treaty on peaceful nuclear explosions and had agreed on the inclusion of hydrodynamic and seismic methods of verification and on-site inspections in the protocol on verification to the 1974 treaty on the limitation of nuclear tests, and on the yield levels above which these measurements would be taken.

They agreed in principle with the "open sky" proposal President Bush made in May, which could make a tangible contribution to the cause of openness and stronger trust. They declared their willingness to attend an international conference on this matter.

The sides commented on the importance of concerted action by the USSR and United States to prevent the proliferation of missiles and missile technology and agreed to intensify the bilateral consultations on this pressing problem.

There was also a detailed and frank exchange of views on regional issues. The sides expressed their support for the efforts of Central American countries to establish lasting peace in the region on the basis of the treaty signed in Esquipulas and later agreements. They reaffirmed their adherence to the Geneva agreements on Afghanistan and their support for more active efforts to achieve peace in the Middle East. They advocated a comprehensive political settlement in Cambodia, announcing their willingness to join other states in declaring a moratorium on military aid to all sides in Cambodia as part of the comprehensive settlement. They agreed that the UN plan for the granting of independence to Namibia has to be carried out in full and on schedule and expressed their support for the process of national conciliation in Angola and the efforts to secure peace and stability in Mozambique. They also advocated the peaceful political settlement of internal conflicts in Ethiopia.

The minister and secretary signed an intergovernmental agreement on reciprocal trips by the inhabitants of the Bering Strait zone, an agreement on a regional commission in this zone, and a joint USSR-U.S. statement on a common interpretation of the international laws regulating peaceful passage through territorial waters. They approved the working document on mutually acceptable terms of the recognition of the jurisdiction of the UN World Court.

The sides agreed to begin negotiating the possible expansion of airline traffic between the USSR and United States.

They agreed in principle that Soviet and American cultural information centers would be opened in Washington and Moscow.

26—The first unofficial Soviet-American conference of experts on anti-terrorist activity began in Los Angeles.

At a special briefing in the Pentagon, the head of the American delegation at the talks on nuclear and space weapons in Geneva, G. Cooper, said that the United States plans to invite Soviet technical experts to the United States soon to inspect the laboratories working on the "Star Wars" program in Los Alamos (New Mexico) and San Juan Capistrano (California).

27—At a working meeting in New York, E.A. Shevardnadze and J. Baker continued their discussion of some items on the Wyoming agenda.

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